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A METHOD FOR THE DIRECT TRANSFORMATION OF HEAT
ENERGY INTO ELECTRICAL ENERGY

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UNEDITED ROUGH DRAFT TRANSLATION

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A METHOD FOR THE DIRECT TRANSFORMATION OF HEAT ENERGY INTO ELECTRICAL ENERGY

I. K. Vul'fel'dt

A defect in all known means of directly transforming heat energy into electrical energy with a converter with non-linear capacitors is that, in order to operate the converter, it is necessary in all these methods to obtain a power supply from a storage battery. This leads to a substantial increase in the weight and dimensions of the converter, a decrease in its reliable efficiency, and complication in its use.

The proposed method excludes the necessity for initial capacitor activation in the sources and enables us to raise the efficiency and functional reliability of the energy converter, and also to lower its weight, dimensions, and inertia.

This is attained by connecting a capacitor together with a linear inductance into a circuit operating at parametric resonance at a frequency half of that at which the dielectric heats.

The essence of the method consists in alternately heating and cooling the capacitor, the dielectric of which possesses a penetrability which is a function of temperature. As a result of a change in the

capacitance of the capacitor a variable electric current is excited in the circuit.

The drawing shows a circuit illustrating the parametric resonance method of converting heat energy into electrical energy.

The basic element of the circuit is the ferroelectric non-linear capacitor 1 connected in the circuit together with inductance coil 2 and resistance 3.

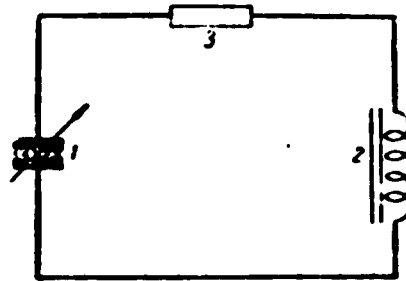
At the moment of starting there is some very slight initial charge on capacitor 1. When the stream of heat impinging on the surface of the capacitor changes, the temperature of the capacitor's dielectric also changes, which leads to a decrease in the penetrability of the dielectric and consequently in the capacitance of the capacitor. Thus, heat energy has accomplished work counter to the forces of the electrostatic field, as a result of which the electrical energy in the capacitor increases. The capacitor then discharges into inductance 2 and its energy goes over into magnetic energy. After a quarter-cycle the current in the circuit is again equal to zero, but the capacitor has overcharged itself to voltage which is greater than the original one by an amount proportional to the energy added to the oscillating circuit.

By intermittently acting with a stream of heat on capacitor 1 of the oscillating circuit in which apparent sources of electric current are lacking electrical oscillations are excited in it, i.e., the direct transformation of heat energy into electrical energy is obtained.

Subject of the Invention

A method of directly transforming heat energy into electrical energy by intermittently heating and cooling a non-linear electrical capacitor with a dielectric, the penetrability of which is a function of temperature, for the excitation of an alternating current as a

result of the alternating change in the capacitance of the capacitor, differing in this, that in order to raise the efficiency and functional reliability of the energy converter, and also to decrease its weight, dimensions, and inertia, the indicated capacitor together with a linear inductance is included in a circuit functioning at parametric resonance at a frequency half that of the dielectric heating frequency.



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